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1 Hose Clamping Device2 Background of the Invention

3 The present invention relates to a device for securing
4 hoses, particularly those used by fire fighters.

5 The Relevant Technology

6 When fighting a fire there are a number of problems to be
7 addressed in addition to extinguishing the fire, for
8 example rescuing those who are trapped or crowd control.
9 As a result the available human resources need to be
10 carefully targeted to limit/prevent the occurrence of
11 injury.

12 Brief Summary of the Invention

13 The present invention recognises that as part of fire-
14 fighting the use and control of a hose is an onerous task
15 requiring the efforts of several people. The present
16 invention attempts to mitigate this problem and allow for
17 better targeting of available resources.

18

19 It is an object of the present invention to provide a
20 device whereby a hose can be clamped to a support thus
21 allowing fire fighters to be released from such duties
22 and available for other tasks, for example rescuing those
23 who are trapped.

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1 It is a further object that such a device will be simple
2 to use and readily adapted to the dimensions of different
3 hoses.

4

5 According to the present invention there is provided a
6 universal hose clamp comprising a universal hose locating
7 mechanism, a hose coupling for connecting a hose to the
8 hose clamp, and a securing means for securing said
9 locating mechanism to a support structure.

10

11 Preferably the support structure is an existing railing,
12 pole or other similar structure.

13

14 Preferably the securing means is a universal base
15 clamping mechanism adapted for clamping onto the support
16 structure.

17

18 Alternatively the support structure is a portable
19 independent frame.

20

21 More preferably the portable independent frame is a
22 tripod.

23

24 Preferably in this second embodiment the securing means
25 is a locking mechanism adapted to lockably engage the
26 hose locating mechanism to the support structure, wherein
27 the locking mechanism comprises a male and female member
28 that are adapted to lockably engage.

29

30 Preferably the hose locating mechanism comprises a
31 central mount, two Azimuth locking mechanisms and a quick
32 release hose mount.

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1 More preferably the Azimuth locking mechanism contained
2 on the locating mechanism comprises a handle assembly, a
3 connection means and a stab pin.

4

5 Preferably the Azimuth locking mechanism contained on the
6 locating mechanism moves between an unlocked position
7 when the handle assembly is in a plane parallel to the
8 stab pin, and a locked position when the handle assembly
9 is rotated through 90 degrees to lie in a plane
10 perpendicular to the stab pin.

11

12 Preferably the first Azimuth locking mechanism contained
13 on the locating mechanism provides a means for rotating
14 the hose coupling about an axis in the horizontal plane.

15

16 Preferably the second Azimuth locking mechanism contained
17 on the locating mechanism provides a means for rotating
18 the hose coupling about an axis in the vertical plane.

19

20 Preferably the hose coupling comprising a gripping aid, a
21 mounting band and a securing means.

22

23 Preferably the gripping aid is cylindrical in shape.

24

25 More preferably the gripping aid is made of a flexible
26 material, namely rubber.

27

28 Preferably the mounting band is cylindrical in shape.

29

30 Preferably the securing means is a screw thread mechanism

31

32 Preferably the attachment means for the hose coupling to
33 the universal hose clamp is easily detachable.

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1 More Preferably the attachment means is by way of an
2 Azimuth locking mechanism.

a 3 *Brief descriptions of the drawings*

4 In order to provide a better understanding of the
5 invention embodiments will now be described by way of
6 example only with reference to the accompanying Figures
7 in which:

8

9 Figure 1 illustrates a universal hose clamp for
10 locking and securing a hose;

11

12 Figure 2 illustrates a component of the
13 universal hose clamp, namely a universal hose
14 locating mechanism, with two Azimuth locking
15 mechanisms shown in a locked position;

16

17 Figure 3 and 4 illustrate separate perspective
18 views of a further component of the universal
19 hose clamp, namely a universal base clamping
20 mechanism shown clamped to a Y-shaped handrail;

21

22 Figure 5 illustrates the universal hose clamp
23 of Figure 1 one of the universal Azimuth
24 locking mechanisms for controlling the hose
25 clamp rotation about the vertical axis in the
26 unlocked position; and

27

28 Figure 6 illustrates a tripod on which the
29 universal hose clamp of Figure 1 can be
30 mounted;

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a Detailed description of the drawings Preferred Embodiment

1 Referring initially to Figure 1, a universal hose clamp
2 is generally depicted at 1 comprising a universal hose
3 locating mechanism 2, a universal base clamping mechanism
4 3 and a hose coupling 4.

5

6 The hose coupling 4 comprises a cylindrical gripping aid
7 5, a cylindrical mounting band 6 and a screw thread
8 mechanism 7.

8

10 Figure 2 illustrates further detail of the universal hose
11 locating mechanism 2 in the absence of the base clamping
12 mechanism 3 and the hose coupling 4. The hose locating
13 mechanism 2 comprises a central mount 8, two Azimuth
14 locking mechanisms 9 and 10 and a quick release hose
15 mount 11.

1

17 The two Azimuth locking mechanisms 9 and 10 further
18 comprise a handle assembly 12, a connection means 13 and
19 a stab pin 14 or 15. The connection means 13 provides
20 the activation mechanism for moving the Azimuth locking
21 mechanisms 9 and 10 between their unlocked and locked
22 positions. In Figure 2 both locking mechanisms 9 and 10
23 are in their locked positions. When unlocked the first
24 Azimuth locking mechanism 9 allows rotation of the hose
25 mount 11, and hence the hose coupling 4, about a
26 horizontal axis while the second Azimuth locking
27 mechanism 10, when unlocked, allows rotation about a
28 vertical axis. It should be noted at this point that
29 these two mechanisms lock independently of each other
30 such that one may be in the locked position while the
31 other is in the unlocked position. The stab pins 14 and
32 15 form the Azimuth locking mechanism.

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2 Figures 3 and 4 present further detail of the universal
3 base clamping mechanism 3 in the absence of the hose
4 locating mechanism 2. The base clamping mechanism 3
5 comprises a central frame 16, a rail clamp 17 and a
6 female 18 for the Azimuth locking mechanism 10. The rail
7 clamp 17 further comprises a swing over lock 19, a rail
8 clamp tightening assembly 20, and two threaded locating
9 rails 21.

10

11 The combination of the hose locating mechanism 2 and the
12 base clamping mechanism 3 is achieved by inserting the
13 stab pin 15 in the female locking component 18 with the
14 handle assembly 12 in the unlocked position, as in Figure
15 5. This unlocked position corresponds to the case when
16 the handle assembly 12 is in a plane parallel to the stab
17 pin 15. The locked position is achieved by rotating the
18 handle assembly 12 through 90 degrees such that the
19 handle assembly 12 now lies in the plane perpendicular to
20 the stab pin 15, as in Figure 1.

21

22 To employ the universal hose clamp 1, the base clamping
23 mechanism 3 is attached to a railing, pole or other
24 similarly reinforced structure. As shown in Figure 1,
25 the desired structure to which the hose clamp 1 can be
26 attached may take the form of a Y-shaped rail 22.
27 Initially the swing over lock 19 is opened by unscrewing
28 one of the threaded locating rails 21. This allows the
29 rail clamp 17 to be placed in situ around the hand rail
30 22. With the hand rail 22 in place above the threaded
31 locating rails 21, the swing over lock 19 is then closed
32 and fastened. The base clamping mechanism 3 is then

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1 secured in place by tightening of the rail clamp 17 by
2 use of the rail clamp tightening assembly 20.

3

4 The second stage is to attach the hose locating mechanism
5 2 to the base clamping mechanism 3 via the vertical
6 Azimuth locking mechanism 10 as described above.
7 Thereafter the hose (not shown) is inserted within the
8 cylindrical hose gripping aid 5 which is then tightened
9 in the cylindrical mounting band 6 that is attached to
10 the quick release hose mount 11. The tightening of the
11 cylindrical hose gripping aid 5 in the cylindrical
12 mounting band 6 is achieved via the screw thread
13 mechanism 7. With the horizontal Azimuth locking
14 mechanism 9 in the unlocked position the hose coupling 4
15 is mounted on the horizontal stab pin 14.

16

17 At this stage the hose is secured within the hose clamp 1
18 and can be deployed at full pressure by just one person.
19 This has the obvious advantage of releasing manpower to
20 carry out other important duties. By simply unlocking
21 either of Azimuth locking mechanisms, 9 and 10, the hose
22 can be rotated to provide universal cover over 4π
23 steradians.

24

25 Mobility for the hose coupling 4 may be enhanced by its
26 incorporation with a tripod system 23, as illustrated in
27 Figure 6. This tripod 23 comprises a female member 24
28 for use in an Azimuth locking mechanism 10, adjustable
29 legs 25 and a cross brace 26 to provide additional
30 strength. It should be noted that the aforementioned
31 female 24 is of a similar design to the female member 18
32 used in the previously described embodiment. Therefore,
33 there is no requirement for the modification of the hose

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1 locating mechanism 2. With this embodiment the tripod is
2 assembled at the required location. The hose (not shown)
3 is then mounted in the hose locating mechanism 2 as
4 previously described. The vertical stab pin 15 is then
5 inserted in the female of the tripod 18 and locked as
6 required by the vertical Azimuth locking mechanism 10.

7

8 The use of alternative hose diameters is determined by
9 the nature of the emergency. Thus the hose coupling 4 is
10 not limited to use with one particular hose size.
11 Selection of a hose can be accommodated within a
12 particular cylindrical gripping aid 5 by the adjustment
13 of the screw thread mechanism 7. If the hose diameter is
14 significantly different then the quick release hose mount
15 11 allows a second hose clamp 4 of the desired dimensions
16 to be quickly mounted on the hose locating mechanism 2.

17

18 An advantage of the present invention is that there is
19 provided a universal hose clamp which can be used with
20 known types of hose and whose parts are readily
21 interchanged to meet the requirements of different
22 emergency situations.

23

24 A further advantage of the present invention is that
25 there is provided means which will reduce the manpower
26 required to control a hose, and increase the numbers
27 available to help those who are part of the emergency
28 situation.

29

30 A further advantage of the invention is that the
31 individual securing means are able to rotate such that
32 the hose can be used in any direction thus allowing the
33 changing needs of an emergency situation to be met.

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2 In an alternative embodiment the clamp may be provided
3 with means to enable control from a remote source. For
4 example an electronic receiver and control electronics
5 could be mounted within the central mount 8 of the
6 universal hose locating mechanism 2. This would allow
7 the direction of the hose coupling 4 to be altered
8 without the requirement for direct human contact.

9

10 Further modifications and improvements may be added
11 without departing from the scope of the invention herein
12 intended.

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